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gotten illustration of North American Sphingidæ," a copy of which was presented to Harvard College by Mr. Wm. Calverley, of Barnegat, N. J., in October, 1887. The work consists of twenty-seven quarto plates of figures of Sphingidæ, and one of *Papilio calverleyi*. Dr. Hagen gives a careful description of the work, with a table of contents of the plates. As a copy was also given by Mr. Calverley to the Library of Cornell University, I am able to add a few facts of interest.

The lettering on the plates was done by hand. This accounts for a difference between the Harvard copy, as described by Hagen, and the one before me. In the former the names of the species figured on plate XV. are not indicated; in the Cornell copy they are given as follows: I. *Enyo camertus*, female; II. *Sphinx paphus*, male; III. *Macrosila hasdrubal*, female; IV. *Anceryx scyron*, female; V. *Calliomma lycastus*, female. In the Cornell copy all the plates are colored except plates XXII., XXIII. and XXIV. The plate illustrating *Papilio calverleyi* does not properly belong with the others; it is the same figure that was given with the original description of the species.¹

The following statements are taken from a letter written by Mr. W. H. Edwards, Oct. 14, 1885, in reply to inquiries from the Cornell Library: "The work was never finished and never published. I gave away two or three copies of plain plates myself to friends; but have all the rest of my share here now. John W. Weidemeyer lived at Montclair, N. J., and did business in Cliff Street, New York. Stephen Calverley lived in Brooklyn. These two began the printing of plates of Sphinges. I joined them at second plate. I think twenty-eight plates were done; all drawn by Charles Waldo. Two plates were done in London, under supervision of the late Francis Walker, of the British Museum. I think four hundred copies were struck off. Weidemeyer intended to write text for these plates, but never did; and the work rested, and was never resumed."

EMBRYOLOGY.²

HERTWIG'S³ TEXT-BOOK OF HUMAN AND VERTEBRATE EMBRYOLOGY.—This very valuable hand-book of vertebrate embryology has just been completed by the publication of the second part, and, to those who know German, it will be a most welcome contribution to this very important subject.

Dr. Hertwig's little treatise is published in a convenient form, in

¹ Proc. Ent. Soc. Phila., 1864, pl. X.

² Edited by Prof. Jno. A. Ryder, Philadelphia.

³ Lehrbuch der Entwicklungsgeschichte des Menschen und der Wirbelthiere. Von Dr. Oscar Hertwig. Octavo, pp. viii, 507. Gustav Fischer, Jena, 1887-1888.

large type, and with illustrations, which leave little to be desired. While the purpose of the work is the same as that of Kölliker's *Grundriss*, viz., for medical students, it presents certain admirable features not met with in the just-named classical and beautiful work of the venerable savant who holds the chair of anatomy in the University of Würzburg. The wonderful and accurate figures which adorn the pages of Kölliker's writings on embryology are no less attractive than the luminous style in which his expositions are couched. But in the *Grundriss* only two types are appealed to—viz., the Bird and Mammal, in order to unravel the intricacies of embryology as applied to the needs of the medical man.

With larger opportunities for study, and as the author of many classical contributions to the embryology of the lower types as well as through studies upon the maturation and fertilization of the egg in various types, Dr. Hertwig approaches his subject equipped with a range and profundity of knowledge not surpassed by any recent writer. His studies in experimental embryology—during which he, in association with his no less distinguished brother, Richard Hertwig, reached results of the most startling significance in causing multiple impregnation of a single ovum by previous immersion in dilute solutions of narcotics or anæsthetics—are still fresh in the minds of specialists. His no less interesting studies upon the phenomena of fertilization of the egg in echinoderms entitle him to rank amongst those pioneers of modern embryology who have given us a basis for a rational theory of heredity, founded, not upon abstract speculations, but upon carefully observed facts.

Through the observation of these facts by Hertwig and others it has been possible also to enunciate the doctrine of the continuity of germinal plasma and the laws of geotropy of the ovum; while his Cœlom theory, published in 1881, has already borne fruit in the admirable English treatise of Professor Haddon, which was noticed about a year since in this journal. This cœlom theory supplements that of the now universally accepted gastrula, and makes it possible to present the facts of embryology in such a manner as to render their comprehension easy and significant. While the protective coverings of ova—i.e., the primary and secondary investments of the eggs of various types—have not been as fully discussed as they might have been, and the existence of a third or tertiary system of deciduous investments, derived from the segmenting ovum itself in the higher forms, has not been perhaps clearly recognized, on the whole the work commends itself as the most satisfactory manual which has yet appeared for those who have not the time to enter upon a special course of study in this branch of scientific discipline.

The author has succeeded, in the compass of two hundred pages, subdivided into thirteen chapters, in presenting in a novel and interesting manner what it is essential that the young naturalist or medical student should know of the sexual elements; the maturation

tion of the egg and the process of fertilization; the process of cleavage; the general principles of development; the development of the two primary germinal layers (*Gastræa* theory); the development of the middle layer (*Cœlom* theory); the history of the doctrine of germinal layers; the somites or segments; the blood and connective tissues (*Mesenchyme* theory); shaping of the external form; egg-envelopes of reptiles, birds, mammals and man. Each of the first thirteen chapters is epitomized at its conclusion in such a manner and in such logical sequence that these epitomes together form, perhaps, the most convenient synopsis of the present status of the principles of embryology.

The remaining three hundred pages of the book deal with organogeny, or the formation of the organs from the epiblast, hypoblast, mesoblast and mesenchyme. This portion is divided into four chapters, and in this respect differs in its method pretty widely from that followed by Haddon, who in his treatise includes a large group of structures, viz., lymphatic, blood-vascular and connective tissues under the subdivision of mesoblast. These are specially dealt with by Dr. Hertwig in a chapter on the mesenchyme.

The great advantage of this last method will be recognized by teachers of histology, who are thus furnished a means of more readily impressing upon the minds of pupils the true relations of that group of tissues and organs which form the intermediary vascular bonds and supporting structures for all the other organs. The genesis of the organs from the other primary layers is admirably illustrated with special reference to its bearings upon the anatomy of the adult human body, and is accomplished in a very satisfactory way, while enough data from comparative embryology are laid under contribution to give the reader a fair knowledge of the wide application of the principles laid down.

The chapter on the principles of development in the first part of the book and the concluding *résumés* of the last four chapters are admirable; and while it is probably premature to form an opinion as to the exact method of the origin of the segmental ducts, the conservative position of the author is probably to be commended. In this connection, further studies upon the germ-bands of the leeches and earthworms, upon which such remarkable results have been published by C. O. Whitman and E. B. Wilson, will probably give us important additional light.

The manual of Dr. Hertwig will doubtless fill a long-felt want; and it is to be hoped that it will be made accessible to the English-reading student through a translation by some capable person. As an aid in understanding many questions in pathology, physiology, the structure of the brain and mechanism of the nervous system, this little work will undoubtedly be found to be of great value in lightening the burden of the overtaxed medical student in his

efforts to master the intricacies of the anatomy and histology of the adult human body.—*J. A. Ryder.*

MR. O. P. HAY'S OBSERVATIONS ON THE BREEDING-HABITS OF AMPHIUMA.—In the last number of this journal (page 95) an interesting account was given of how the *Amphiума* coils herself about her eggs. The description of the eggs and embryos is so strikingly like that of *Ichthyophis glutinosus*, a limbless, worm-like salamander,—the development of which has been worked out by the Sarasin Brothers from material collected in Ceylon,—that it is very important to call attention to this resemblance and its probable significance.

Within about two years Professor Cope called attention to the fact that the structure of the skull of the Cæcilians and of *Amphiума* showed that these two forms were related. It now turns out that the females of these two types have the same habit of coiling themselves about their ova, which in both cases are laid in strings, with constrictions separating them, somewhat like a string of beads, the individual ova in both being also of about the same size. This confirmation of Professor Cope's conclusions as to the taxonomic relations of these two types is a very interesting instance of the way in which embryological data may become available. It may also be noted that in some of the Cæcilians there are three plumose or feathered branchiæ arising close together, and evidently similar to those described by Mr. Hay in the young of *Amphiума*.

It is to be hoped that that gentleman will be good enough to somewhere publish carefully-drawn figures of the egg-strings of *Amphiума*, as well as of the embryos.—*J. A. Ryder.*

ARCHÆOLOGY AND ANTHROPOLOGY.¹

The Anthropological Society of Washington has renewed and enlarged its sphere of usefulness. It has taken a new departure, in fact three new departures. It has elected a new president; it has become an incorporated society, and it has commenced the publication of a quarterly journal under the direction of an editorial committee. The name is *American Anthropologist*, the first number appearing January, 1888. The typography is in the highest order of the art. The article on the Chane-abal (four-language) tribe and dialect of Chiapas, by Dr. Brinton, Professor in the University of Pennsylvania, being done as to excite the admiration of all interested in the typographic art. The contents of the first number, in addition to the article just mentioned, are "The Law

¹ This department is edited by Thomas Wilson, Smithsonian Institution, Washington, D. C.